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10/521,859	01/21/2005	Mark Thomas Johnson	NL 020678	1228

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CARTER III, ROBERT E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/521,859	Applicant(s) JOHNSON ET AL.	
	Examiner Robert E. Carter	Art Unit 2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Multiple dependent claims must use the alternative form. See MPEP 608.019(n).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2, and 6-7 are rejected under 35 U.S.C. 102(e) as being unpatentable over Morrison et al. (US Patent # 6,580,545)

As for claim 1,

Morrison et al. teaches:
An electrochromic display comprising

electrochrome pixels (Fig. 2, # 50) comprising at least a first electrochrome material Fig. 2, # 58) and a second electrochrome material (Fig. 2, # 60) between two electrodes (Fig. 2, # 52, 62), the first electrochrome material changing from a transparent state to a color absorbing state for at least partly absorbing a first color when a pixel voltage across the electrochrome pixel has a first value, the first electrochrome material changing from the color absorbing state to the transparent state when the pixel voltage has a second value having a polarity opposite to the first value (Col. 10, lines 23-31, Col. 9, lines 18-24), and the second electrochrome material changing from a transparent state to a color absorbing state for at least partly absorbing a second color different than the first color when the pixel voltage has a third value, the second electro-chrome material changing from the color absorbing state to the transparent state when the pixel voltage has a fourth value having a polarity opposite to the third value (Col. 10, lines 32-39, Col. 9, lines 18-24).

Morrison et al. does not explicitly teach:

The absolute value of the third value being smaller than an absolute value of the first value, and the absolute value of the fourth value being smaller than an absolute value of the second value.

However, Morrison does state in Col. 9, lines 18-24 that differing electrochromic materials have different switching values, therefore the absolute values of the third and first values would be different, and the absolute values of the fourth and second values would also be different. As long as the values are different, the relationship between them is arbitrary. For example, if one simply switches which electrochromic material is designated the first material, then the relationship between the values reverses and the absolute value of the third value is now larger than an absolute value of the first value, and the absolute value of the fourth value is now larger than an absolute value of the second value.

As for claim 2,

Morrison et al. teaches all the limitations of claim 1, and further teaches:

Wherein the first electrochrome material and the second electrochrome material are two separate layers (Fig. 2, # 58, 60).

As for claim 6,

Morrison et al. teaches all the limitations of claim 1, and further teaches:

Wherein the electrochrome pixels further comprise a third electrochrome material (Fig. 2, # 64) changing from a transparent state to a color absorbing state for at least partly absorbing a third color different than the first and the second color when the pixel voltage has a fifth value, the third electro-chrome material changing from the color absorbing state to the transparent state when the pixel voltage has a sixth value having a polarity opposite to the third value (Col. 10, lines 42-51, Col. 9, lines 18-24).

Morrison et al. does not explicitly teach:

The absolute value of the fifth value being smaller than an absolute value of the third value, and the absolute value of the sixth value being smaller than an absolute value of the fourth value.

However, Morrison does state in Col. 9, lines 18-24 that differing electrochromic materials have different switching values, therefore the absolute values of the fifth and third values would be different, and the absolute values of the sixth and fourth values would also be different. As long as the values are different, the relationship between them is arbitrary. For example, if one simply switches which electrochromic material is designated the third material, then the relationship between the values reverses and the absolute value of the fifth value is now larger than an absolute value of the third value, and the absolute value of the sixth value is now larger than an absolute value of the fourth value.

As for claim 7,

Morrison et al. teaches all the limitations of claim 6, and further teaches:

Wherein the first, second a third electrochrome material in their color absorbing state appear cyan, magenta, and yellow, respectively (Col. 11, lines 16-20).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al. (US Patent # 6,580,545) in view of Maletin et al. (US Patent # 6,602,742).

As for claim 4,

Morrison et al. teaches all the limitations of claim 2, however Morrison et al. does not teach the limitations of claim 4.

Maletin et al. teaches:

A supercapacitor with electrodes having a nano-porous surface (Col. 10, lines 33-41). Which has superior performance due to the high specific surface area and thin cross section of the nano-porous electrodes (Col. 18, line 66 – Col. 19, line 6).

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. with the nano-porous electrodes in Maletin et al. in order to reduce the thickness of the display device while increasing the cross sectional area and reducing the resistance of the electrodes, thereby increasing the power efficiency of the display.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al. (US Patent # 6,580,545) in view of Sawano (US Patent # 6,762,150).

As for claim 3,

Morrison et al. teaches all the limitations of claim 1, however Morrison et al. does not teach the limitations of claim 3.

Sawano teaches:

A color electrochromic medium to record and display an image (Fig. 5) wherein the first electrochrome material (Fig. 5, # 19a) and the second electrochrome material (Fig. 5, # 19b) are mixed in a one layer mixture (Fig. 5, # 19).

Therefore because both Morison et al. and Sawano are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. by replacing the three material vertical stack with the single mixed layer in Sawano to simplify manufacturing and reduce the thickness of the display (Sawano, Col. 1, lines 54-55).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al. (US Patent # 6,580,545) in view of Sawano (US Patent # 6,762,150) and further in view of Maletin et al. (US Patent # 6,602,742).

As for claim 4,

Morrison et al. in view of Sawano teaches all the limitations of claim 3, however Morrison et al. does not teach the limitations of claim 4.

Maletin et al. teaches:

A supercapacitor with electrodes having a nano-porous surface (Col. 10, lines 33-41). Which has superior performance due to the high specific surface area and thin cross section of the nano-porous electrodes (Col. 18, line 66 – Col. 19, line 6).

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. in view of Sawano with the nano-porous electrodes in Maletin et al. in order to reduce the thickness of the display device while increasing the cross sectional area and reducing the resistance of the electrodes, thereby increasing the power efficiency of the display.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al. (US Patent # 6,580,545) in view of Sano et al. (US P # 4,528,073).

As for claim 5,

Morrison et al. teaches all the limitations of claim 1, however Morrison et al. does not teach the limitations of claim 5.

Sano et al. teaches:

A method for manufacturing colored filters and an electrochromic display (Fig. 7) using those filters, wherein the electrochrome pixels comprise a color filter (Fig. 7, # 3) for filtering any one of three primary colors (Col. 2, lines 8-15).

Therefore because both Morison et al. and Sano et al. are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. by adding the color filter in Sano et al. to create a full color display with only one or two electrochromic materials, which simplifies manufacturing and lowers cost (Sano et al., Col. 9, lines 1-5).

Claims 8-9, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al. (US Patent # 6,580,545) in view of Harada et al. (US Publication # 2001/0,040,542).

As for claims 8 and 12,

Morrison et al. teaches all the limitations of claim 1, however Morrison et al. does not teach the limitations of claims 8 and 12.

Harada et al. teaches:

An LDC display comprising

LCD pixels (Fig. 1, # 1) comprising at least a first LCD sub pixel Fig. 1, # 8C) and a second LCD sub pixel (Fig. 1, # 8B) between two electrodes (Fig. 1, # 5, 4), the first LCD sub pixel changing from a transparent state to a color absorbing state for at least partly absorbing a first color when a pixel voltage across the LCD pixel has a first value, the first LCD sub pixel changing from the color absorbing state to the transparent state when the pixel voltage has a second value, and the second LCD sub pixel changing from a transparent state to a color absorbing state for at least partly absorbing a second color different than the first color when the pixel voltage has a third value, the second LCD sub pixel changing from the color absorbing state to the transparent state when the pixel voltage has a fourth value.

Harada et al. further teaches a method and driver circuit (Fig. 1, # 20) for driving an LCD pixel of the LCD display, the driver circuit comprising means for applying the pixel voltage across the LCD pixel successively as follows:

(i) the pixel voltage has art absolute value and a polarity for changing towards the transparent state of both the first LCD sub pixel and the second LCD sub pixel (Fig. 14B),

(ii) the pixel voltage has an absolute value and a polarity for changing the transparent state into the color absorbing state of both the first LCD sub pixel and the second LCD sub pixel, and is applied as long as required to obtain a desired amount of absorption of the first LCD sub pixel (Fig. 14A),

(iii) the pixel voltage has an absolute value and a polarity for changing towards the transparent state of the second LCD sub pixel, while the first LCD sub pixel is unaffected (Fig. 14E), and

(iv) the pixel voltage has an absolute value and a polarity for changing the transparent state of the second LCD sub pixel into the color absorbing state, while the first electrochrome material is unaffected, and is applied as long as required to obtain a desired amount of absorption of the second LCD sub pixel (Fig. 14H).

Therefore because both Morison et al. and Harada et al. are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. by using the driving circuit and method in Harada et al. to allow driving of the display with only one pair of electrodes in stead of three pair, reducing the thickness of the display, simplifying manufacturing, and reducing cost.

As for claims 9 and 13,

Morrison et al. teaches all the limitations of claim 1, however Morrison et al. does not teach the limitations of claims 9 and 13.

Harada et al. teaches:

An LDC display comprising

LCD pixels (Fig. 1, # 1) comprising at least a first LCD sub pixel Fig. 1, # 8C) and a second LCD sub pixel (Fig. 1, # 8B) between two electrodes (Fig. 1, # 5, 4), the first LCD sub pixel changing from a transparent state to a color absorbing state for at least partly absorbing a first color when a pixel voltage across the LCD pixel has a first value, the first LCD sub pixel changing from the color absorbing state to the transparent state when the pixel voltage has a second value, and the second LCD sub pixel changing from a transparent state to a color absorbing state for at least partly absorbing a second color different than the first color when the pixel voltage has a third value, the second LCD sub pixel changing from the color absorbing state to the transparent state when the pixel voltage has a fourth value.

Harada et al. further teaches a method and driver circuit (Fig. 1, # 20) for driving an LCD pixel of the LCD display, the driver circuit comprising means for applying the pixel voltage across the LCD pixel successively as follows:

(i) the pixel voltage has an absolute value and a polarity for changing towards the color absorbing state of both the first LCD sub pixel and the second LCD sub pixel (Fig. 14A),
(ii) the pixel voltage has an absolute value and a polarity for changing the color absorbing state into the transparent state of both the first LCD sub pixel and the second

LCD sub pixel, and is applied as long as required to obtain a desired amount of absorption of the first LCD sub pixel (Fig. 14B),

(iii) the pixel voltage has an absolute value and a polarity for changing towards the color absorbing state of the second LCD sub pixel, while the first LCD sub pixel is unaffected (Fig. 14F), and

(iv) the pixel voltage has an absolute value and a polarity for changing the color absorbing state of the second LCD sub pixel into the transparent state, while the first electrochrome material is unaffected, and is applied as long as required to obtain a desired amount of absorption of the second electrochrome material (Fig. 14C).

Therefore because both Morison et al. and Harada et al. are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. by using the driving circuit and method in Harada et al. to allow driving of the display with only one pair of electrodes in stead of three pair, reducing the thickness of the display, simplifying manufacturing, and reducing cost.

Claims 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al. (US Patent # 6,580,545) in view of Bruechmann et al. (US Patent # 6,501,457) and further in view of Harada et al. (US Publication # 2001/0,040,542).

As for claims 10 and 14,

Morrison et al. teaches all the limitations of claim 1, however Morrison et al. does not teach the limitations of claims 10 and 14.

Bruechmann et al. teaches:

An electrochromic panel and driver circuit comprising a comparator (Col. 3, lines 7-14) and method for comparing a current amount of absorption of the panel with a required amount of absorption dictated by an external control signal (Col. 2, lines 35-45). Bruechmann et al. further states that this driving method is more efficient that previous methods (Col. 2, lines 23-27), that it can be adapted to any type of electrochromic construction, material, or dimensions, (Col. 2, lines 56-63), and that the driver can be a separate unit or integrated into the electrochromic panel itself (Col. 2, lines 63-66). These teachings suggest that the driver in Bruechmann et al. could be used to drive an individual pixel in an electrochomic display panel, and could be integrated into the construction of such a display.

Therefore because both Morison et al. and Bruechmann et al. both disclose a drive circuit and method for driving an electrochromic panel, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. by using the comparative driving method in Bruechmann et al. to optimize the electrical energy supplied to the electrochromic display.

Harada et al. teaches:

An LDC display comprising

LCD pixels (Fig. 1, # 1) comprising at least a first LCD sub pixel Fig. 1, # 8C) and a second LCD sub pixel (Fig. 1, # 8B) between two electrodes (Fig. 1, # 5, 4), the first LCD sub pixel changing from a transparent state to a color absorbing state for at least partly absorbing a first color when a pixel voltage across the LCD pixel has a first value, the first LCD sub pixel changing from the color absorbing state to the transparent state when the pixel voltage has a second value, and the second LCD sub pixel changing from a transparent state to a color absorbing state for at least partly absorbing a second color different than the first color when the pixel voltage has a third value, the second LCD sub pixel changing from the color absorbing state to the transparent state when the pixel voltage has a fourth value.

Harada et al. further teaches a method and driver circuit for driving an LCD pixel of the LCD display, the driver circuit comprising

means for applying the pixel voltage across the LCD pixel having an absolute value and a polarity for changing towards the transparent state of both the first LCD sub pixel and the second LCD sub pixel, when the required amount of absorption is lower than the current amount of absorption, or for applying the pixel voltage across the LCD pixel having an absolute value and a polarity for changing towards the color absorbing state of both the first LCD sub pixel and the second LCD sub pixel, when the required amount of absorption is higher than the current amount of absorption,

the means for applying the pixel voltage being adapted for supplying the pixel voltage across the LCD pixel having an absolute value and a polarity for changing towards the

transparent state of the second LCD sub pixel while the first LCD sub pixel is unaffected, when the required amount of absorption is lower than the current amount of absorption, or for applying the pixel voltage across the LCD pixel having an absolute value and a polarity for changing towards the color absorbing state of the LCD sub pixel while the first LCD sub pixel is unaffected, when the required amount of absorption is higher than the current amount of absorption.

Therefore because both Morison et al. and Harada et al. are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrochromic display in Morrison et al. in view of Kuriyama et al. by using the driving circuit and method in Harada et al. to allow driving of the display with only one pair of electrodes in stead of three pair, reducing the thickness of the display, simplifying manufacturing, and reducing cost.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Kimura et al. (US Patent # 7,116,309) discloses a multicolor electrochromic display using stacked electrochromic layers.

Akashi et al. (US Patent # 6,268,092) discloses a multicolor display using color filters.

Sharp (US Patent # 5,990,996) discloses a color LCD display using stacked LCD cells.

Sugahara et al. (US Patent # 5,790,215) discloses discloses a color LCD display using stacked LCD cells.

Sammells (US Patent # 4,807,977) discloses multicolor electrochromic display cells

Suginoya et al. (US Patent # 4,781,444) discloses a multicolor display using color filters.

Takahashi et al. (US Patent # 4,135,790) discloses an electrochromic display element having a plurality of laminated electrochromic layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert E. Carter whose telephone number is 571-270-3006. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 571-272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

REC

Kent Chang

KENT CHANG
PRIMARY EXAMINER